

# Notice of Allowability

Application No.

10/644,575

Examiner

Anthony Fick

Applicant(s)

DAVIS, PHILIP

Art Unit

1753

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to amendment of 3/9/07.
2. ☒ The allowed claim(s) is/are 1-9 and 15-21.
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) ☐ All b) ☐ Some\* c) ☐ None of the:
    1. ☐ Certified copies of the priority documents have been received.
    2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
    3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\* Certified copies not received: \_\_\_\_\_.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.  
**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
  - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
    - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date \_\_\_\_\_.
  - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_\_.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

## Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO/SB/08),  
Paper No./Mail Date \_\_\_\_\_
4. ☐ Examiner's Comment Regarding Requirement for Deposit  
of Biological Material
5. ☐ Notice of Informal Patent Application
6. ☐ Interview Summary (PTO-413),  
Paper No./Mail Date \_\_\_\_\_
7. ☐ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other \_\_\_\_\_

## **DETAILED ACTION**

### ***Remarks***

1. Applicant's amendments to the claims have overcome the previous rejections under 35 U.S.C. 112 second paragraph. The rejections are therefore withdrawn.

### ***Response to Amendment***

2. The declaration filed on March 9, 2007 under 37 CFR 1.131 is sufficient to overcome the Hiller et al. reference.

### ***Allowable Subject Matter***

3. Claims 1 through 9 and 15 through 21 are allowed.
4. The following is an examiner's statement of reasons for allowance: the claims are drawn to an underwater power generator and a method of generating power underwater. The claims require an underwater vessel that navigates through an underwater thermocline in a body of water, and a plurality of thermoelectric modules in thermal contact with the water and a phase change material. The closest prior art that utilizes an environmental temperature gradient and a phase change material to produce power via thermoelectric elements is Hiller et al. (U.S. 6,914,343).

Hiller discloses a generator and method of generating power from environmental temperature cycles. Figure 6A shows a power generator comprising a portion of a shell, fins and layer attached to fins, made from a thermally conductive material, said portion having an outer surface in contact with the surrounding fluid (air) environment and an inner surface opposing said outer surface not in contact with the surrounding environment, a plurality of thermoelectric converters, p and n blocks, electrically coupled

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together having a first surface and a second surface thermally coupled to the inner surface of the portion of the shell, and a phase change material, ice-water mixture, thermally coupled to each thermoelectric device that has a phase change temperature approximately the average of the upper and lower temperatures of the environment, wherein the thermoelectric devices generate electrical power as the generator transits through the environment (column 4, paragraph 1). It is the position of the examiner that the rotation of the planet, Earth or Mars, on which the device of Hiller sits, provides transit of the device through the environmental change of warm air to cold air.

First, the reference to Hiller has been overcome via applicant's declaration under 37 CFR 1.131 and can no longer be considered prior art. Second, the amended claims require navigation of the underwater vessel through the thermocline. The device of Hiller simply sits on the planet surface and involves no navigation.

Another piece of prior art that obtains electricity from an underwater thermocline is Koyanagi et al. (U.S. 5,430,322). Koyanagi teaches an ocean electric generation system that uses a temperature difference in seawater to produce electricity. The device in figure 4, flows cold water from a deep portion of the sea and warm water from the surface portion of the sea across thermoelectric elements to produce electricity from the temperature difference (column 8, lines 40-60).

However Koyanagi does not disclose moving the thermoelectric elements through the water via an underwater vessel, instead using pumps to move the deep water up to the surface. Also, Koyanagi does not utilize a phase change material to maintain the temperature of the other side of the thermoelectric elements. It would not

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be obvious to alter Koyanagi to place the elements onto an underwater vessel and incorporate a phase change material as these changes would destroy the invention of Koyanagi. The permanent nature of Koyanagi's device allows for supply of electricity that cannot occur if the device was placed on a moving vessel. Therefore, the claims are allowable over the prior art.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anthony Fick whose telephone number is (571) 272-6393. The examiner can normally be reached on Monday - Friday 7 AM to 4 PM.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen can be reached on (571) 272-1342. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Anthony Fick  
AU 1753  
May 10, 2007

ADF

  
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